

but represent a true structural peculiarity of this tissue. That these varicosities, which often continue in an uninterrupted line across large fields of view, correspond with the course of one set of fibres. The varicosities may, therefore, be caused by the presence of this set of cross fibres. The only alternative explanation which has occurred to me is that there may be a rhythmic, simultaneous action of all the ameloblasts concerned in the deposit of the material for enamel building. The last theory seems to be less reasonable than the first.\*

7th. The Retzius bands are often as distinctly marked in forming as in mature teeth, and in teeth which have been kept constantly moist as they are in dried specimens. The enamel rods are often seen to pass without break across several of these bands. The bands are principally due to a deposit of pigment, and not to imprisoned air or gas as claimed by von Ebner.

V. "The Healing of Incisions in Vegetable Tissues." By SAMUEL G. SHATTOCK. Communicated by Sir JAMES PAGET, Bart., F.R.S. Received December 4, 1895.

(Abstract.)

The five methods of wound repair in man and the higher animals:—

- (1) Immediate union. (2) Primary adhesion. (3) Granulation.
- (4) Secondary adhesion. (5) Beneath a scab.

The third and fifth concern the healing of *open* wounds, and are referred to only incidentally.

IMMEDIATE UNION, *i.e.*, union of the cells actually divided.—Never observed. Experiments made on the planule of *Faba vulgaris*.

PRIMARY ADHESION.—All growing parenchyma readily heals after incision. Mode of experiment.

(A) Healing by primary adhesion without separation of surfaces.

- (1) Without sclerosis of the scar-tissue. In the shoots of *Ancuba*. Stages: Cell division on either side of the incision; absence of suberisation; interruption of the line of the adpressed remains of the opened cells by the interpolation of new. The absence of cork formation not due to inability to form it.

- (2) With sclerosis of the scar-tissue. In kohl-rabi. The line of scar-tissue broken by the growth of indifferent parenchyma.

\* Since the above was written, I have demonstrated that there is a simultaneous deposit of the spherical bodies over the entire surface of forming enamel.—J. L. W.

Fate of starch shed into an incision. Removed from slowly dying parts.

(B) Healing by primary adhesion with partial separation of the faces of the incision from tension.

- (1) Without sclerosis. In *Faba vulgaris*, without cork formation exposure, the incentive to production of cork. Effusion of coagulable latex in petioles of *Rheum*, a hindrance to union.
- (2) With sclerosis of the callus cells.

SECONDARY ADHESION.—The process that may be compared with that so named in animal pathology, viz., union occurring between two surfaces previously healed by cork from exposure.

Two varieties: (1) Union between the living cork-cells.

- (2) Union by indifferent perenchyma after disruption of the cork.

The first observed in the aerial roots of *Philodendron*. The second in *Echinocactus*; not the final stage of union in the callus formed from the cambium after stripping of bark or amputation in exogenous shrubs and trees.

Callus growth observed in rare cases from the medullary rays after exposure of wood. Union by secondary adhesion in grafting.

The healing of incisions in plants corresponds, therefore, in general with that by primary and secondary adhesion in animal textures.

The analogy with secondary adhesion in the latter is not exact, however, because the two surfaces which coalesce are first healed by cork-tissue; in animals they remain granulating till brought together.

*Presents, December 12, 1895.*

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